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Investigation of red-cockaded woodpeckers in Virginia: 2009 report

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Cover Photo of helper bird at Cluster 8 by Bart Paxton.

The Center for Conservation Biology is an organization dedicated to discovering innovative solutions to environmental problems that are both scientifically sound and practical within today's social context. Our philosophy has been to use a general systems approach to locate critical information needs and to plot a deliberate course of action to reach what we believe are essential information endpoints.

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Executive Summary

During the calendar year of 2009, 47 Red-cockaded Woodpeckers were identified within Piney Grove preserve. This included 29 birds that were hatched at Piney Grove from previous years, 15 fledglings produced during the 2009 breeding season, and 3 birds translocated to Piney Grove from the Carolina Sandhills National Wildlife Refuge, SC in previous years. During the winter survey, 41 birds were detected using 10 different cluster areas. This was the first year birds were observed roosting in C-13 since it was established as an artificial recruitment cluster.

Twenty-eight adult birds were believed to be present within the Piney Grove preserve going into the breeding season of 2009. These were distributed among 7 potential breeding clusters in 2009 however breeding was only known to occur in 6 of these clusters. Young birds were produced at C-1, C-3, C-5, C-7 C-8, and C-10. These clusters produced a total of 15 nestlings that survived to fledge. The breeding pair in C-10 nested after one nest failure but the pair re-nested and successfully fledged 2 birds.

The number of known Red-cockaded Woodpeckers (RCW) cavity trees increased in 2009. In December 2008, Piney Grove contained 136 cavities in live trees including 35 start cavities, 43 completed cavities, and 58 artificial inserts. Thirteen cavities were added and one cavity tree died in 2009. In December 2009, Piney Grove contained 149 cavities in live trees including 41 start cavities, 48 completed cavities, and 60 artificial inserts. Of the 108 available natural cavities or inserts, 44 had fresh or recent chipping and sap flow from resin wells in April 2009.

There were 25 instances of cavity competitors in RCW cavities from January to June 2009. Southern flying squirrels accounted for 60% of other occupant species. A total of 28 individual flying squirrels were removed on 15 occasions from 13 of the 108 available cavity trees. C10 and C15 combined accounted for 61% of the total number of flying squirrels removed.

BACKGROUND

Context

The Red-cockaded Woodpecker (*Picoides borealis*) is a federally endangered species. Within the past 100 years Red-cockaded Woodpeckers have disappeared completely from the northern portion of their breeding range. Historically, this species was recorded north into New Jersey and Pennsylvania. As recently as the 1930's and 1940's resident birds were known from the open maritime forests of Maryland. Since the recent loss of habitat in Kentucky, Virginia has supported the only population north of the Carolinas. In Virginia, breeding has continued to the present time but the number of both sites and birds has declined dramatically over the past 40 years. As recently as 1977, 23 clans were known scattered across 5 counties. In 1980, all clusters determined to be active in 1977 were surveyed in preparation for an investigation of habitat use (Bradshaw 1990). Of the 23 original clusters, only 9 were still forested. In the 4 years from 1977 to 1980, more than half of the known state population had been lost. By 1990, only 5 of the original 23 clusters detected in 1977 were still active. By 2000, this number had declined to only 2 clusters. During the breeding season of 2002, Virginia supported only 2 breeding pairs and 2 clusters with solitary males.

The Red-cockaded Woodpecker remains in eminent danger of extinction within Virginia. However, in 1998 a multi-organizational partnership was formed under the primary mission of stabilizing the population and restoring it back to pre-1980 levels. During that year, The Nature Conservancy negotiated a deal with Hancock Timber to purchase 1,100 ha of land supporting the last 3 known Red-cockaded Woodpecker breeding groups. The site has since been expanded and now includes 1,270 ha of pine land. The tract, located in Sussex County is named the Piney Grove Preserve and lies in the heart of the species former Virginia range. The site has become the nucleus for restoration work in Virginia.

Restoration of the Red-cockaded Woodpecker population in Virginia will require a long-term commitment and the use of aggressive techniques that have proven successful further south. Dramatic habitat management, population monitoring and management, and translocation of birds into the population have been ongoing since 2000 and are beginning to show promising results. Since 2001, the total population and the number of potential breeding clusters (defined as having 1 adult male and 1 adult female) have doubled (Figure 1).

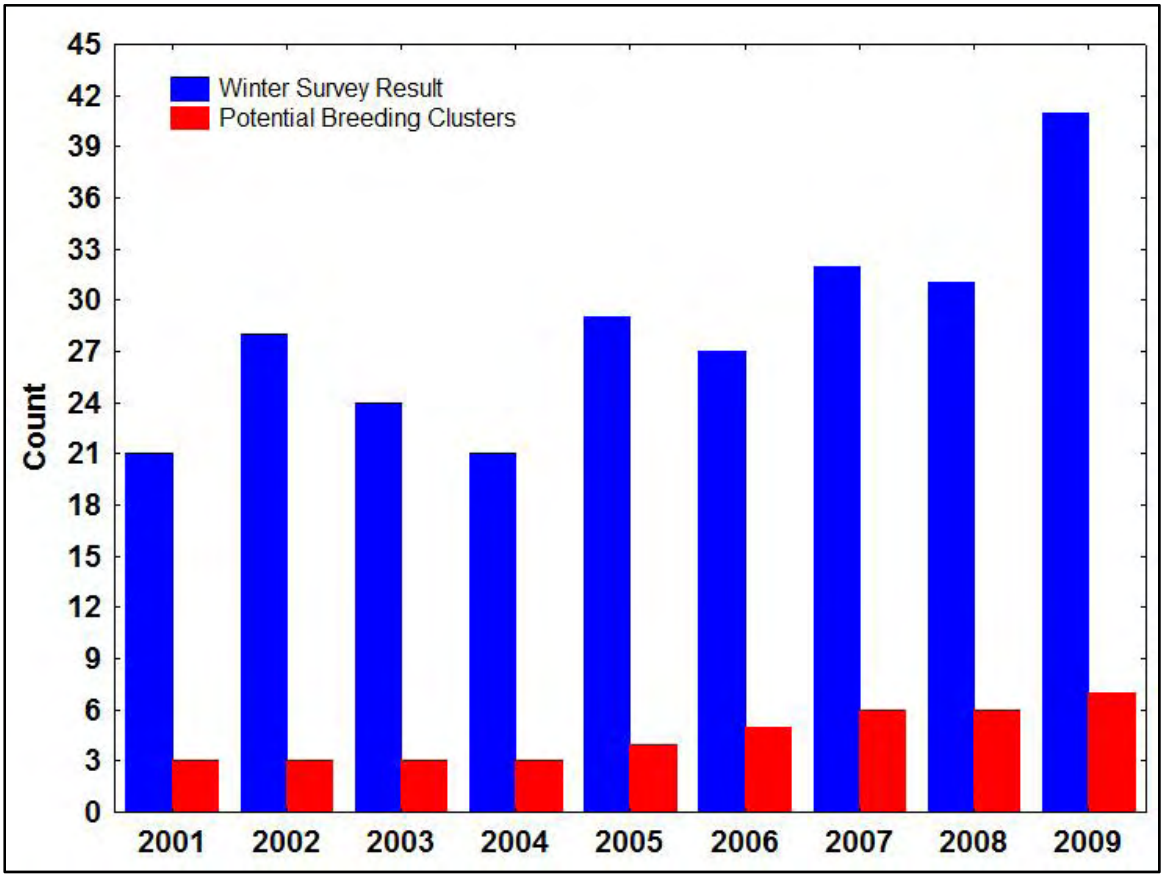

Figure 1. Winter population count and number of potential breeding clusters of Red-cockaded woodpeckers at the Piney Grove Preserve.

Objectives

The primary objective of this ongoing project is to monitor the population of Red-cockaded Woodpeckers within the Piney Grove Preserve. A secondary objective is to collect information relevant to the continued management of birds and their habitat in Virginia. Specific objectives include

1) To determine the number and identification of all birds resident within Piney Grove during the 2009 calendar year.
2) To monitor breeding activity in order to document productivity and allow for the unique banding of all individuals within the population.
3) To monitor and manage nest trees and cavity condition.

METHODS

Description

Piney Grove Preserve contains an old-growth loblolly, pond pine, and short-leaf pine community in Sussex County, Virginia. The site supports a complex of moderate-age pine stands interspersed with pockets of older trees ranging from 80 to 140 years. Historically, the site was managed for saw timber on a relatively long rotation by Gray Lumber Company. The site was purchased by Hancock Timber Resource Group in 1993. Under Hancock Timber's management, site quality was improved by removing the dense hardwood understory. The Nature Conservancy purchased the tract from Hancock Timber in 1998. The Nature Conservancy has developed an aggressive management program designed to restore the disturbance regime necessary to return the site to an open pine savannah.

A single clan of Red-cockaded Woodpeckers was discovered within this site in 1985. A second clan was discovered in 1994 and a third in 1995. These 3 clans still remain active. Since 1999, there have been 12 recruitment clusters established by The Nature Conservancy through the installation of artificial cavities. There are now 15 independent cluster sites with either natural or artificial cavities.

Banding

Being able to identify individual birds is an essential element of the monitoring program. Banding individuals with unique combinations of color bands allows for their identification and, for this reason, has been one of the project goals.

Adults – Adult birds are captured using a specialized net mounted on a telescopic pole shortly after they roost at dusk. The birds are "roosted" and the net is raised in place and the bird is enticed out into the net. Net poles are only effective on cavities below 50 feet in height. In 1998, Don Schwab banded 10 Red-cockaded Woodpeckers within the Piney Grove complex. In 2000, 7 of these birds were still resident within Piney Grove. During 2000, Bryan Watts banded an additional 4 adult birds, leaving only 2 unbanded birds in the population (1 each in clusters 3 and 5). The 2 remaining unbanded adults within clusters 3 and 5 were lost during 2004 and 2005 respectively. Since this time, all birds within the population have been individually identified by unique, color-band combinations.

Nestlings – For logistical and safety reasons, banding of Red-cockaded Woodpecker nestlings is restricted to an age window of 5-10 days. Because of this restriction, close monitoring of breeding activity is essential to successful banding. During the early portion of the breeding season, both the breeding pair and the nest cavity from each cluster area were monitored closely to determine clutch initiation dates. Where cavity height permits, breeding status is determined via the use of a miniature video camera mounted on an extendable pole. The pole can accommodate cavity heights to 50 ft. For cavities exceeding that height, breeding status was determined by visual

monitoring of activity at the cavity. After dates of incubation were determined, an estimated hatching date was calculated. Nest cavities were monitored closely around the time of expected hatching to verify hatch dates. The window for banding was determined from estimated hatching dates.

All nestlings were banded during the recommended age window. Nest trees were climbed with ladders and nestlings were extracted from cavities using a noose apparatus. Nestlings were then lowered to the ground, banded, and returned to the cavity. Each nestling received a unique combination of color bands as described above. Nestlings were weighed at the time of banding using a Pesola spring scale. In the first 2 weeks after fledging, birds were identified and sex was determined by crown plumage.

General Observations

As in previous years, 2 systematic surveys of all birds within Piney Grove were conducted to identify individuals and to determine distribution. Surveys were conducted in the early spring prior to the expected breeding window and in early winter after the expected dispersal period. All clusters were visited before dawn to count the number of individuals emerging from roost cavities and/or joining emerging birds to determine clan size. Birds were followed while foraging so that color band combinations could be read with spotting scopes. Biologists systematically worked through all sites over a period of days until all individuals were identified. Once clutches were laid, observations were made at the nest cavity to identify the breeding male and female for each site.

Cavity Monitoring and Management

Cavity tree status – Data on the status of each cavity tree were collected during March and April 2009. Each cavity tree was visited once for 2009 from January through July to evaluate tree characteristics and characteristics for each cavity on the tree. Tree condition was categorized into the following: live or dead; standing, broken, or fallen; beetles; lightning strike; and red heart disease. Characteristics of each cavity were collected to describe its condition, entrance, plate, and activity status (Appendix I). Cavity characteristics were categorized as follows:

Cavity stage/ 09 Condition:

1-Complete – Natural cavity
2-Complete (New) – Newly completed since last update
3-Advanced Start: > 10 cm centimeter depth
4-Start: 1-10 cm depth
5-Sub-start: Less than one centimeter depth
6-Insert – Artificial cavity

Entrance enlargement:

0-Gone
1-Normal size entrance
2-Enlarged less than twice the normal diameter
3-Enlarged two to four times the normal diameter
4-Enlarged more than four times the normal diameter
R-Restrictor plate reducing entrance to normal size
H-Healing over

Activity:

1-Active: Chipping on resin wells to some degree with fresh sap flow
2-Possibly active: Slight but inconclusive evidence of RCW activity
3-Inactive: No recent RCW activity
4-Relic: No RCW activity for 4 years

Plate size:

5-Unstarted: No plate
4-Started: 0-15 cm diameter plate
3-Completed: 15-30 cm diameter plate
2-Completed: 30-45 cm diameter plate
1-Completed: Greater than 45 cm diameter plate

Chipping on resin wells:

4-Old: No recent RCW activity
3-Recent: Few resin wells have little chipping with little to no sap flow
2-Fresh: Most of resin wells have chipping and bark scaled slightly
1-Fresh: All resin wells have chipping and bark scaled extensively

Sap (applies to fresh and dry):

4-None
3-Less than 1 m of sap flow above and below the cavity
2-One to 2 m of sap flow above and below the cavity
1-Greater than 2m of sap flow above and below cavity around circumference of tree at cavity height

Cavity competitor inspection and removal – All active, completed inactive cavities, and artificial cavity inserts within 50 ft from the ground were checked on a one-month cycle using a camera and monitor mounted on a telescoping pole. Relic cavities were only revisited in December 2007. When cavity competitors were located, the tree was climbed

to remove the competitor or nest material. Amphibians, wasps and bird nests with a tending adult, fresh eggs, or nestlings were not removed.

Historic Sites

Historic sites were not visited this season since most have been degraded and no longer have the potential to support RCWs.

RESULTS

Population Monitoring

During the calendar year of 2009, 47 Red-cockaded Woodpeckers were identified within Piney Grove preserve (Table 1). This included 29 birds that were hatched at Piney Grove from previous years, 15 fledglings produced during the 2009 breeding season, 3 birds translocated to Piney Grove in previous years.

Among the 29 birds detected in 2009 that were originally hatched at Piney Grove, 2 of these were hatched in 2000, 2 hatched in 2004, 5 hatched in 2005, 4 hatched in 2006, 7 hatched in 2007, and 9 hatched in 2008. Among the group of translocated birds remaining in the population included 3 birds moved here from the Carolina Sandhills National Wildlife Refuge (NWR) in different years including the fall/winter of 2002, 2003, and 2005.

There were 7 birds detected in 2008 that were not detected in 2009. This includes 1 bird hatched at Piney Grove in 2003, 1 bird hatched at Piney Grove in 2004, 1 bird hatched at Piney Grove in 2006, 1 bird hatched at Piney Grove in 2008, 1 bird translocated from Gates County, North Carolina in 2002, 1 bird translocated from the Carolina Sandhills NWR in 2005, and a bird that naturally emigrated from the Palmetto Peartree Preserve in North Carolina in 2008.

Twenty-eight adult birds were believed to be present within the Piney Grove preserve going into the breeding season of 2009 (Table 1). This compares to 26, 23, 21, 22, 21, 19, and 16 birds going into the breeding seasons of 2008, 2007, 2006, 2005, 2004, 2003, and 2002 respectively.

Forty-one birds were detected during the winter survey. This includes 18 birds hatched at Piney Grove before 2008, 8 of the 9 birds fledged in 2008, 12 of 15 birds fledged in 2009, and 3 translocated birds. There were 7 birds that were not observed in the winter survey but seen in the spring survey. This includes 1 bird hatched at Piney Grove in 2005, 1 hatched in 2007, 1 hatched in 2008, and 3 hatched in 2009 and known to fledge.

In the winter assessment, birds were roosting in 10 different cluster areas including C-1, C-3, C-4, C-5, C-6, C-7, C-8, C-10, C-13, and C-15 (Table 2). This was

the first time birds were observed roosting at C-13 since it was established as an artificial recruitment site. As in years past, the single bird roosting in C-4 was part of the C-3 clan. Also, a single bird roosting in C-15 joined the C-8 group to forage.

Breeding Observations

Six successful breeding attempts were documented during the 2009 season at C-1, C-3, C-5, C-7, C-8, and C10. A combined total of 15 chicks survived to fledge.

Cluster 1 – The breeding male (AL/OR, DB/DB/WH) in 2009 has remained as the same individual since 2007 marking the third consecutive year this male assumed reproductive duties. This male was translocated from Carolina Sandhills NWR in 2002. The breeding female (LB/WH/LB, AL/YE) remained the same for the second consecutive year. This female was originally hatched in C-5 in 2005 and first detected in C-1 in 2008 when it assumed reproductive duties in that year. Incubation duties were also augmented by at least one helper male (DG/YE/DG, WH/AL) that was originally hatched in C-1 in 2006 and has remained at this cluster since that time. The first egg was detected in tree #45 on 1 May. This is the second consecutive year the pair has nested in tree #45. A full clutch of 4 eggs was noted on 5 May. All 4 eggs were found hatched on 15 May with 2 broken shells still in the nest that day. On 22 May there were only 3 nestlings found in the nest and they were banded as 7-8 day chicks. All 3 of these nestlings successfully fledged and were identified as 1 male and 2 females on 12 June. All three of these fledgling birds were detected during the winter survey in C-1.

Cluster 3 – The breeding male (RE/DB, WH/AL) remained the same since 2007. This was the third consecutive year this male held breeding status. It is presumed that breeding female (LB/WH/LB, RE/AL) remained the same since 2008 since this bird was observed incubating and brooding young. This is the second consecutive year this female has assumed breeding duties. Incubation was aided by a first-year male (DB/RE/DB, DB/AL) and feeding of young was aided by another helper male (DB/RE/DB, AL/DB) that was hatched in C-3 in 2005 and has remained there since that time. The birds nested in tree #8 for the fourth consecutive year. This cavity is too high to be examined by peeper scope. Incubation was first observed on 1 May. On 22 May one 12-day old nestling was banded and one additional nestling was detected but could not be removed from the nest for banding. Both nestlings fledged and were identified as one male and one female on 12 June. The unbanded hatch year bird was subsequently captured and banded on 30 September. Both hatch-year birds were detected during the winter survey.

Table 1. Occurrence of individual Red-cockaded Woodpeckers at Piney Grove Preserve 2001-2009. (X_j indicates 2009 hatch-year bird).

USGS Band	Left Leg	Right Leg	Sex	2001	2002	2003	2004	2005	2006	2007	2008	2009 Spr	2009 Winter
1581-66201	WH/LB/WH	RE/AL	M										
1581-66202	WH/LB/WH	LG/AL	M	X	X	X	X	X					
1581-66203	RE/DB/RE	YE/AL	F	X	X	X							
1581-66204	RE/DB/RE	PU1/AL	F										
1581-66205	RE/DB/RE	DG/AL	M	X	X	X							
1581-66206	DG/YE/DG	DB/AL	M										
1581-66207	WH/LB/WH	WH/AL	F	X	X	X	X	X	X				
1581-66208	RE/DB/RE	PK1/AL	U										
1581-66209	DG/YE/DG	PU/AL	F										
1581-66210	WH/LB/WH	DB1/AL	U										
1581-66211	DG/YE/DG	RE1/AL	F										
1581-66212	WH/LB/WH	YE/AL	M	X	X	X	X	X					
1581-66213	WH/LB/WH	DB2/AL	F										
1581-66214	RE/DB	WH/AL	M	X	X	X	X	X	X	X	X	X	X
1581-66215	RE/DB	LG1/AL	U		X	X	X						
1581-66216	RE/DB	RE1/AL	U										
1581-66219	DG/YE/DG	WH/AL	M	X	X								
1581-66220	WH/LB/WH	PU/AL	U				X	X		X	X	X	X
1581-66221	WH/LB/WH	PK1/AL	U										
1581-66222	WH/LB/WH	AL/RE	U	X									
1581-66223	DG/YE/DG	YE/AL	F										
1581-66224	DG/YE/DG	RE2/AL	M	X	X	X	X	X	X				
1581-66225	RE/DB/RE	RE2/AL	M	X									
1581-66226	RE/DB/RE	LG2/AL	F	X									
1581-66227	RE/DB/RE	PK2/AL	M	X	X								
1581-66228	RE/DB/RE	PU2/AL	M	X	X	X	X						
1581-66229	WH/LB/WH	DG/AL	F	X	X								
1581-66230	WH/LB/WH	AL/YE	F		X	X	X	X	X	X			
1581-66231	WH/LB/WH	PK2/AL	M	X	X	X	X	X	X	X			
1581-66232	WH/LB/WH	AL/DB	M		X	X							
1581-66233	WH/LB/WH	AL/LB	F		X	X							
1581-66234	RE/DB/RE	AL/YE	F		X	X							
1581-66235	RE/DB/RE	AL/RE	F		X	X		X					
1581-66236	RE/DB/RE	AL/DB	M		X								
1581-66237	WH/LB/WH	AL/RE	M			X		X					
1581-66238	WH/LB/WH	AL/PU	F			X	X				X		
1581-66239	WH/LB/WH	AL/DG	U			X							
1581-66240	WH/LB/WH	AL/LG	M			X							
1581-66241	DG/YE/DG	AL/LG	F				X						

USGS Band	Left Leg	Right Leg	Sex	2001	2002	2003	2004	2005	2006	2007	2008	2009	2009
												Spr	Winter
1581-66242	RE/DB/RE	AL/LB	F			X	X						
1581-66243	RE/DB/RE	AL/PK	F			X							
1581-66244	RE/DB/RE	AL/DG	M			X	X						
1581-66245	DG/YE/DG	AL/LB	M			X	X	X	X				
1581-66246	DG/YE/DG	AL/PU	U			X							
1581-66247	DG/YE/DG	AL/WH	U				X						
1581-66248	DG/YE/DG	AL/PU	M				X						
1581-66249	DG/YE/DG	AL/DB	U				X						
1581-66250	LB/WH/LB	AL/PK	M				X	X					
1581-66251	LB/WH/LB	AL/DB	M				X	X	X	X	X	X	X
1581-66252	LB/WH/LB	AL/LB	F				X	X					
1581-66253	DB/RE/DB	AL/WH	F				X	X	X	X	X	X	X
1581-66254	DB/RE/DB	AL/RE	M				X	X		X	X		
1581-66256	LB/WH/LB	AL/OR	F					X					
1581-66257	LB/WH/LB	AL/RE	M					X	X	X	X		X
1581-66258	LB/WH/LB	AL/YE	F					X	X	X	X	X	
1581-66259	DG/YE/DG	AL/DG	F					X					
1581-66260	DG/YE/DG	AL/OR	F					X					
1581-66261	DB/RE/DB	AL/DB	M					X	X	X	X		X
1581-66262	DB/RE/DB	AL/YE	F					X					
1581-66263	DB/RE/DB	AL/PU	F					X	X		X	X	X
1581-66264	WH/RE/WH	AL/DG	F					X	X	X		X	X
1581-66265	LB/WH/LB	AL/WH	F						X	X	X	X	X
1581-66266	LB/WH/LB	RE/AL	F						X	X	X	X	X
1581-66267	WH/RE/WH	AL/RE	F						X				
1581-66268	WH/RE/WH	AL/YE	M						X	X	X		
1581-66269	DG/YE/DG	YE/AL	M						X	X			
1581-66270	DG/YE/DG	WH/AL	M						X	X	X	X	X
1581-66271	DB/RE/DB	YE/AL	F						X	X	X	X	X
1581-66272	OR/OR/OR	RE/AL	M						X				
1581-66273	WH/RE/WH	AL/WH	M							X	X	X	X
1581-66274	WH/RE/WH	AL/DB	M							X	X		X
1581-66275	OR/AL	DB/RE/DB	F							X			
1581-66276	DG/YE/DG	OR/AL	F							X	X	X	X
1581-66277	LB/WH/LB	YE/AL	F							X			
1581-66278	LB/WH/LB	OR/AL	F							X	X	X	X
1581-66279	YE/DB/YE	AL/RE	F							X	X	X	X
1581-66280	YE/DB/YE	AL/YE	M							X	X	X	X
1581-66281	OR/OR/OR	YE/AL	F							X	X	X	
1581-66282	YE/DG/YE	DB/AL	F								X	X	X
1581-66283	WH/AL	YE/DG/YE	F								X	X	X
1581-66284	DB/RE/DB	WH/AL	F								X		X

USGS Band	Left Leg	Right Leg	Sex	2001	2002	2003	2004	2005	2006	2007	2008	2009	2009
												Spr	Winter
1581-66285	DB/RE/DB	DB/AL	M								X	X	X
1581-66286	DB/RE/DB	RE/AL	F								X		
1581-66287	LB/WH/LB	AL/PU	F								X	X	X
1581-66288	LB/WH/LB	AL/DG	M								X	X	X
1581-66289	YE/DB/YE	AL/WH	U										
1581-66290	YE/DB/YE	AL/PU	M								X	X	X
1581-66292	YE/DB/YE	AL/DG	F									X_j	
1581-66293	YE/DB/YE	AL/LB	F									X_j	X
1581-66294	YE/DB/YE	AL/DB	F									X_j	
1581-66296	DG/AL	YE/YE/DG	M									X_j	X
1581-66297	AL/RE	YE/DG/YE	F									X_j	X
1581-66298	AL/DB	YE/DG/YE	F									X_j	X
1581-66299	AL/YE	DB/RE/DB	F									X_j	X
1581-66300	AL/RE	LB/WH/LB	M									X_j	X
1541-29901	AL/DB	LB/WH/LB	M									X_j	X
1541-29902	AL/DB	WH/RE/WH	F									X_j	X
1541-29903	AL/YE	WH/RE/WH	M									X_j	
1541-29904	AL/LB	WH/RE/WH	F									X_j	X
1541-29906	AL/DG	DB/RE/DB	M									X_j	X
821-70901	OR/OR/OR	AL/DG	M									X_j	X
1541-29907	OR/OR/OR	AL/WH	F									X_j	X
C-3 Unbanded	Unbanded	Unbanded	U	X	X	X	X						
C-5 Unbanded	Unbanded	Unbanded	M	X	X	X	X	X					
Translocated Birds													
1751-83047	AL/LG	DB/DB/YE	M	X									
1681-89697	AL/LB	ST/ST/OR	F	X									
1681-89743	AL/DG	WH/WH/PU	F	X	X								
1751-42837	YE/DB/YE	WH/AL	M		X								
1751-42838	YE/DB/YE	LG/AL	M		X								
801-40249	BK/YE/DB	RE/AL	F		X	X	X	X	X	X	X		
1751-83163	AL/OR	DG/DG/OR	F		X								
1751-83133	AL/WH	ST/ST/OR	F		X								
1751-83208	AL/OR	WH/WH/MV	M		X								
1681-89800	AL/LG	PU/PU/LG	M		X								
1751-82968	AL/WH	OR/OR/DB	F		X								
1751-83201	AL/OR	WH/WH/LB	F		X								
1751-83213	AL/OR	OR/OR/LG	M		X								
1751-83142	AL/OR	DB/DB/WH	M		X	X	X	X	X	X	X	X	X
1751-83234	AL/YE	WH/WH/WH	F			X							
951-26443	AL/YE	DG/DG/LG	F			X							

USGS Band	Left Leg	Right Leg	Sex	2001	2002	2003	2004	2005	2006	2007	2008	2009	2009
												Spr	Winter
951-26448	AL/YE	DG/DG/MV	M			X		X	X	X			
1751-83183	AL/OR	YE/YE/WH	M			X	X	X	X	X			
951-26305	AL/YE	YE/YE/WH	M			X	X	X	X	X	X	X	X
1581-66262	WH/WH/WH	AL/WH	M					X					
941-92246	AL / ST	OR/OR/YE	M										
1951-05035	AL / PU	WH/WH/MV	M					X					
1951-05086	AL/MV	MV/MV/WH	F					X	X	X	X	X	X
941-92233	AL / ST	WH/WH/LG	F					X	X	X	X		
941-92268	AL / ST	PU/PU/WH	F					X					
Foreign or unknown birds													
Unknown	MV/LG	LG/AL	U					X					
1841-53714	RE/YE/RE	AL/OR	F							X	X		
1581-66291	WH/WH/WH	RE/AL	F								X	X	X

Table 2. Roost clusters for Red-cockaded Woodpeckers detected within Piney Grove Preserve during the 2009 winter assessment.

Roost Cluster	FWS Band #	Left Leg	Right Leg	Sex	Age
C-1	1581-66296	DG/AL	YE/DG/YE	M	0
C-1	1581-66297	AL/RE	YE/DG/YE	F	0
C-1	1581-66294	AL/DB	YE/DG/YE	F	0
C-1	1581-66270	DG/YE/DG	WH/AL	M	3
C-1	1581-66283	WH/AL	YE/DG/YE	F	1
C-1	1751-83142	AL/OR	DB/DB/WH	M	7
One of the birds listed below in the C-3 clan was roosting in C-4 but individual not identified					
C-3	821-70901	OR/OR/OR	AL/DG	M	0
C-3	1581-66253	DB/RE/DB	AL/WH	F	6
C-3	1581-66287	LB/WH/LB	AL/PU	F	1
C-3	1581-66285	DB/RE/DB	DB/Al	M	1
C-3	1581-66266	LB/WH/LB	RE/AL	F	3
C-3	1581-66214	RE/DB	WH/AL	M	9
C-3	1581-66299	AL/YE	DB/RE/DB	F	0
C-3	1581-66265	LB/WH/LB	AL/WH	F	4
C-3	1581-66284	DB/RE/DB	WH/AL	F	1
C-3	1581-66261	DB/RE/DB	AL/DB	M	4
C-5	1581-66288	LB/WH/LB	AL/DG	M	1
C-5	1581-66220	WH/LB/WH	PU/AL	M	9
C-5	1951-05086	AL/MV	MV/MV/WH	F	4

Table 2 contd.

Roost Cluster	FWS Band #	Left Leg	Right Leg	Sex	Age
C-5	1581-66300	AL/RE	LB/WH/LB	M	0
C-5	1541-29901	AL/DB	LB/WH/LB	M	0
C-5	1581-66257	LB/WH/LB	AL/RE	M	4
C-6	1581-66263	DB/RE/DB	AL/PU	F	4
C-6	1541-29906	AL/DG	DB/RE/DB	M	0
C-6	1581-66284	DB/RE/DB	WH/AL	F	1
C-7	1581-66273	WH/RE/WH	AL/WH	M	2
C-7	951-26305	AL/YE	YE/YE/WH	M	6
C-7	1581-66271	DB/RE/DB	YE/AL	F	3
C-7	1541-29902	AL/DB	WH/RE/WH	F	0
C-7	1541-29904	AL/LB	WH/RE/WH	F	0
C-7 (C-9)	1581-66279	YE/DB/YE	AL/RE	F	1
C-8 (C-15)	1581-66290	YE/DB/YE	AL/PU	M	1
C-8	1581-66278	LB/WH/LB	OR/AL	F	2
C-8	1581-66280	YE/DB/YE	AL/YE	M	2
C-8	1581-66251	LB/WH/LB	AL/DB	M	5
C-8	1581-66293	YE/DB/YE	AL/LB	F	0
C-8	1581-66282	YE/DG/YE	DB/AL	F	1
C-10	1581-66264	WH/RE/WH	AL/DG	M	4
C-10	1581-66276	DG/YE/DG	OR/AL	F	2
C-10	1541-29907	OR/OR/OR	AL/WH	F	0
C-13	1581-66291	WH/WH/WH	RE/AL	F	1
C-13	1581-66274	WH/RE/WH	AL/DB	M	2

Cluster 5 – The breeding pair remained the same as in 2007. The breeding male (WH/LB/WH, PU/AL) was originally banded as a nestling at C-5 in 2000 and the breeding female (AL/MV, MV/MV/WH) was translocated to Piney Grove from Carolina Sandhills, NWR in 2005. This is the third year these pair have assumed reproductive duties after replacing two former breeders in 2007. An additional male (LB/WH/LB, AL/RE) was seen helping in all breeding activities from incubating, brooding, and feeding young. Also a bird of unidentified gender (WH/LB/WH, PU/AL) also aided incubation. The breeding pair nested in tree # 26 for the third consecutive year. This nest cavity that is too high be examined with the peeper scope. Incubation was first detected for the first time on 8 May with all four aforementioned birds rotating turns at incubation. On 6 June two nestlings were banded at 10 days age and two unhatched eggs were present in the nestThe hatch year birds were successfully fleged by 12 June when they were identified as 2 males. Both fledglings were observed again in C-5 during the winter survey.

Cluster 7 – The breeding male (AL/YE, YE/YE/WH) remained the same since 2005. This bird was translocated to C-7 from Carolina Sandhills, NWR in 2003 and has been present within this cluster since that time. To date, it has been the only male to breed at this cluster. The breeding pair in 2008 failed at the egg stage. The breeding female appears to have been replaced. The female from last year (WH/LB/WH, AL/PU) was not detected in 2009. The new female (DB/RE/DB, YE/AL) was not detected incubating but was the only female present at the site in 2009. The new female was hatched at C-3 in 2006 but was first detected using C-7 in 2007 as well as being detected floating to C-6. Two eggs were first observed in tree # 194 on 15 May. This was the first year this tree cavity was used for nesting. On 19 May a full clutch of 3 eggs was observed. All three eggs hatched and nestlings were banded on 5 June. There was a measurable level of developmental differences between the nestlings and were estimated to be 8, 9, and 10 days based on morphology. All 3 nestlings successfully fledged and were identified as 2 females and 1 male on 25 June. The 2 hatch-year females were detected during the winter survey but the male was not found in the Piney Grove population.

Cluster 8 – This was the third consecutive year breeding occurred at C-8 but only the second consecutive year for the current breeding pair. The breeding male (LB/WH/LB, AL/DB) was originally banded in C-5 in 2004 and the breeding female (LB/WH/LB, OR/AL) was originally banded at C-5 in 2007. The pair nested in a new tree this season (#175) and 4 eggs were first detected on 8 May. All 4 eggs were found to be hatched on 12 May and all 4 nestlings banded on 19 May. Two helpers at this site were identified as birds originally hatched at this site (YE/DB/YE, AL/YE and YE/DB/YE, AL/PU in 2007 and 2008, respectively). Only 3 of 4 nestlings successfully fledged and all were identified as females on 11 June. Two of the 3 fledges were detected during winter surveys in C-8 and the remaining individual was not detected.

Cluster 10 – The breeding pair is presumed to have remained the same individuals as 2008 (male: WH/RE/WH, AL/DG and female: DG/YE/DG, OR/AL) after breeding likely occurred between these two individuals but was not officially documented in 2008. If so, then this pair nested in tree 154 in 2009 for most likely the second consecutive year. Two eggs were detected on 1 May but both of these eggs were missing on 5 May. The pair re-nested and 2 eggs were detected on 12 May. A complete clutch of 4 eggs was found on 19 May. Only 2 of the 4 eggs hatched on 26 May. The nestlings could not be removed from the nest on 5 June and were estimated to be 11-12 days of development based on morphological characters. The 2 nestlings successfully fledged with a female leaving the nest on 16 June and a male at least 2 days later. Each nestling was subsequently banded with the male being banded at C-10 on 17 December and the female at C-5 on 5April 2010. Both hatch-year birds were detected during winter surveys.

Table 3. Red-cockaded Woodpecker nestlings banded in 2009 on Piney Grove Preserve.

Cluster	Date	FWS	Left	Right	Age	Mass (g)	Sex
C-1	5/22/09	1581 66296	DG/AL	YE/DG/YE	8	31.0	M
C-1	5/22/09	1581 66297	AL/RE	YE/DG/YE	7-8	25.0	F
C-1	5/22/09	1581 66298	AL/DB	YE/DG/YE	8	30.5	F
C-3	5/22/09	1581 66299	AL/YE	DB/RE/DB	11-12	41.0	F
C-3	9/30/09	1541-29906	AL/DG	DB/RE/DB	< 1yr		M
C-5	6/5/09	1581 66300	AL/RE	LB/WH/LB	10	39.5	M
C-5	6/5/09	1541 29901	AL/DB	LB/WH/LB	10	39.5	M
C-7	5/29/09	1541 29902	AL/DB	WH/RE/WH	10	32.0	F
C-7	5/29/09	1541 29903	AL/YE	WH/RE/WH	9	33.0	M
C-7	5/29/09	1541 29904	AL/LB	WH/RE/WH	8	23.0	F
C-8	5/19/09	1581 66292	YE/DB/YE	AL/DG	7	33.0	F
C-8	5/19/09	1581 66293	YE/DB/YE	AL/LB	7	31.5	F
C-8	5/19/09	1581 66294	YE/DB/YE	AL/DB	6	19.5	F
C-8	5/19/09	1581 66295*	YE/DB/YE*	RE/AL*	6	15.5	*
C-10	12/17/09	1541-29907	OR/OR/OR	AL/WH	< 1yr		F
C-10	4/5/2010	821-70901	OR/OR/OR	AL/DG	< 1yr		M

*nestling did not fledge

Translocations

No translocations of birds into Piney Grove have been conducted since 2005.

Cavity Trees

In 2009, Piney Grove contained 149 cavities in live trees including 41 start cavities, 48 completed cavities, and 60 artificial inserts (Appendix I). Fourteen new cavities and starts were added to the number of known cavity trees at Piney Grove and one tree, containing an artificial insert, died in 2009 (Table 4). Five trees were found in 2009 containing two newly completed natural cavities and four starts. Three inserts were installed in new trees. One newly completed cavity and four starts were discovered in previously tagged cavity trees.

Of the 108 available natural cavities or inserts, 44 had fresh or recent chipping and sap flow from resin wells in spring 2009 (Table 5). Of the 60 inserts in live trees, 16 (27%) had fresh or recent resin work. Of the 48 natural cavities, 28 (58%) had fresh or recent resin work.

Table 4. Red-cockaded Woodpecker cavity changes in each cluster area on Piney Grove Preserve during 2009

Cluster area	Tree tag number	2009 Tree Condition	2009 Cavity Condition	2009Activity status
C-2	62	Dead	Insert	Inactive
C-3	4a	Live	Start	Inactive
C-5	23a	Live	Natural Complete	Active
C-6	135a	Live	Start	Active
C-7	194a	Live	Start	Active
C-7	NT1	Live	Start	Active
C-7	NT1	Live	Start	Active
C-8	129	Live	Natural Complete	Active
C-8	155	Live	Start	Active
C-8	174c	Live	Start	Active
C-10	156	Live	Natural Complete	Active
C-13	126	Live	Insert	Inactive
C-16	165	Live	Start	Active
C-16	166	Live	Insert	Inactive
C-16	167	Live	Insert	Inactive

Table 5. Active Red-cockaded Woodpecker cavity counts in each cluster area on Piney Grove Preserve in April 2009

Cluster area	Artificial insert	Completed natural cavity
C-1	0	8
C-2	0	0
C-3	2	5
C-4	1	0
C-5	0	6
C-6	1	0
C-7	2	3
C-8	3	3
C-9	0	0
C-10	2	3
C-11	0	0
C-12	0	0
C-13	1	0
C-14	0	0
C-15	4	0

Cavity competitor inspection and removal— There were 25 instances of cavity competitors in RCW cavities during the 2009 calendar year (Table 6). Multiple cavity competitor species occurring simultaneously in a cavity were counted as separate occurrences. Multiple individuals of one species found together in a cavity were counted as one occurrence. Southern flying squirrels accounted for 15 of the 25 occurrences (60%). A total of 28 individual flying squirrels were removed on 15 occasions from 13 of the 106 available cavity trees. Occupants were found in about one fourth (24%) of available RCW cavities in 2009. Sixty-two percent of the 13 cavities affected by flying squirrels were artificial inserts. C10 and C15 combined accounted for 61% of the total number of flying squirrels removed (Appendix III).

Table 6. Red-cockaded Woodpecker cavity competitor occurrences on Piney Grove Preserve in 2009

Cavity Occupant	Number of cavities	Number of occurrences
Southern Flying Squirrels removed	13	15
Flying squirrel and nest material	25	28
Unidentified other bird nest	4	4
White-breasted nuthatch	3	3
Great-crested flycatcher	1	1
Wasp	2	2

Historic Sites

Historic sites were not visited this season since most have been degraded and no longer have the potential to support RCWs. Descriptions of each site are based on 2006 visits.

Route 460 Site (Sussex County)

Site Condition – This site remains intact but is severely degraded from midstory encroachment and limited size. Habitat on both sides of this tract has been harvested in the last 20 years leaving this island of mature timber too insignificant to consider for management purposes.

Cavity tree status – None detected.

Bird status – No evidence of activity present.

Route 35 Site (Southampton County)

Site Condition – The site was purchased by Ashton Lewis Lumber Company in late 2001 and harvested in winter 2002. Remaining timber on this tract is relegated to two small stands (less than 20 ha each) primarily in the 40 -60 year age class. Next nearest stand of mature timber is a small 15 ha block approx. 3 km away.

Cavity tree status – All were harvested or knocked down in the harvest.

Bird status – No recent evidence of birds.

Route 612 Site (Southampton County)

Site Condition – With the exception of 135 acres that surrounds the cluster area, this site was harvested in the summer of 2003 by Virginia-Carolina Properties. Harvest was carried out under agreement with the Virginia Department of Game

& Inland Fisheries and the U.S. Fish and Wildlife Service. Under a Habitat Conservation Plan developed in cooperation with the U.S. Fish and Wildlife Service, the Virginia Department of Game & Inland Fisheries, The Nature Conservancy, and the Center for Conservation Biology, the lone, male Red-cockaded Woodpecker was moved to the Piney Grove Preserve and the remaining 135 acres were harvested in the late spring of 2005.

Rt. 40 Site (Sussex County)

Site Condition – The core site between Rt 40 and old Rt 40 is still intact, although hardwood encroachment and a dense pine subcanopy have all but removed access to any potential cavity trees. Ashton Lewis Lumber Company purchased this site from Gray Family Trust in 2002. They have since harvested all of the mature timber around this site, leaving only the historic triangle of old-growth timber still standing. This remaining tract is less than 25 ha and is too degraded to be of any use to red-cockaded woodpeckers. Ashton Lewis has received authority to harvest the remaining acreage as soon as the site dries out enough to get equipment in.

Cavity tree status – All historic cavity trees are dead or have been enlarged to the point of excluding red-cockaded as users.

Bird status – Last detection was a vocalizing bird to the southeast of the stand in spring, 1996.

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Appendix I. Status of Red-cockaded Woodpecker cavities on Piney Grove in 2009.

Cluster	Tree	Species	Condition	Cavity	09 Status	09 Condition	09 Entrance	09 Plate	09 Resin Work
1	35	Loblolly	Live	Natural	Active	Start (Ad)	Normal	Unstarted	Recent
1	36	Loblolly	Live	Artificial	Relic	Insert	Normal	>15 cm	Old
1	37	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old
1	38	Shortleaf	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
1	39	Loblolly	Live	Natural	Active	Complete	Normal	> 45 cm	Fresh
1	40	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
1	41	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
1	42	Loblolly	Live	Natural	Relic	Start	Healing	Unavailable	Unavailable
1	43	Loblolly	Live	Natural	Relic	Complete	>4X	15-30 cm	Old
1	44	Loblolly	Live	Natural	Relic	Complete	>4X	15-30 cm	Old
1	45a	Loblolly	Live	Natural	Active	Complete	Normal	30-45 cm	Fresh
1	45b	Loblolly	Live	Natural	Inactive	Complete	<2X	30-45 cm	Old
1	46	Loblolly	Live	Natural	Relic	Complete	>2X	>15 cm	Old
1	47	Loblolly	Live	Natural	Relic	Start (Ad)	Restrictor	Unstarted	Old
1	48	Loblolly	Live	Natural	Active	Complete	Normal	> 45 cm	Fresh
1	49	Loblolly	Live	Natural	Relic	Complete	>4X	15-30 cm	Old
1	50	Shortleaf	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
1	51	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
1	52	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
1	53	Loblolly	Live	Natural	Active	Complete	<2X	30-45 cm	Fresh
1	54	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Fresh
1	55	Loblolly	Live	Natural	Active	Complete	<2X	Unstarted	Fresh
1	57	Loblolly	Live	Natural	Active	Complete	Normal	30-45 cm	Fresh
1	58	Loblolly	Live	Natural	Active	Complete (New)	Normal	Unstarted	Fresh
1	102	Loblolly	Live	Natural	Relic	Complete	>2X	>15 cm	Old
1	117	Loblolly	Live	Artificial	Relic	Insert	Normal	>15 cm	Old
1	59a	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Fresh
1	59b	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Recent
1	164	Loblolly	Live	Natural	Active	Complete	Normal	30-45 cm	Fresh
2	60	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
2	61	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
2	62	Loblolly	Dead	Artificial	Relic	Insert	Normal	Unavailable	Unavailable
2	63	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
3	1	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Fresh
3	2	Loblolly	Live	Artificial	Active	Insert	Restrictor	>15 cm	Recent
3	4a	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old
3	4b	Loblolly	Live	Natural	Active	Complete	Restrictor	30-45 cm	Fresh
3	5	Loblolly	Live	Natural	Relic	Start	Normal	Unstarted	Old
3	6	Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Recent
3	7	Loblolly	Live	Natural	Active	Start (Ad)	Normal	Unstarted	Recent
3	8	Loblolly	Live	Natural	Active	Complete	<2X	15-30 cm	Fresh
3	71	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
3	72	Loblolly	Live	Natural	Relic	Complete	>4X	>15 cm	Old
3	74	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
3	75	Loblolly	Live	Natural	Relic	Complete	>2X	Unstarted	Old
3	76	Loblolly	Live	Artificial	Inactive	Insert	Normal	>15 cm	Old
3	77	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
3	80	Loblolly	Live	Natural	Active	Start (Ad)	Normal	Unstarted	Fresh
3	177	Loblolly	Live	Artificial	Inactive	Insert	Normal	>15 cm	Old
3	178	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old
3	3a	Loblolly	Live	Natural	Active	Complete	Restrictor	> 45 cm	Fresh
3	3b	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old
3	79a	Loblolly	Live	Natural	Relic	Complete	>2X	30-45 cm	Old
3	79b	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Recent
3	79c	Loblolly	Live	Natural	Inactive	Start	Restrictor	Unstarted	Old
3	9a	Loblolly	Live	Natural	Active	Start	<2X	Unstarted	Recent
3	9b	Loblolly	Live	Natural	Active	Complete (New)	Normal	15-30 cm	Fresh
3	9c	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old
4	81	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
4	82	Loblolly	Live	Artificial	Active	Insert	Normal	>15 cm	Fresh
4	83	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
4	84	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old

Appendix I. cont.

Cluster	Tree	Species	Condition	Cavity	09 Status	09 Condition	09 Entrance	09 Plate	09 Resin Work
4	186	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
5	18	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Fresh
5	19	Loblolly	Live	Natural	Active	Complete (New)	Normal	Unstarted	Fresh
5	20	Loblolly	Live	Natural	Relic	Complete	Restrictor	> 45 cm	Old
5	21	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
5	22	Loblolly	Live	Natural	Relic	Complete	>4X	> 45 cm	Old
5	23a	Loblolly	Live	Natural	Active	Complete	Restrictor	>15 cm	Fresh
5	23b	Loblolly	Live	Natural	Active	Complete	Restrictor	> 45 cm	Fresh
5	24	Loblolly	Live	Natural	Active	Complete	Restrictor	>15 cm	Old
5	25	Loblolly	Live	Natural	Active	Complete	Normal	30-45 cm	Fresh
5	26	Loblolly	Live	Natural	Active	Complete	Restrictor	>15 cm	Fresh
5	27	Loblolly	Live	Natural	Inactive	Complete	Restrictor	>15 cm	Old
5	28	Loblolly	Live	Natural	Inactive	Complete	Restrictor	>15 cm	Old
5	29	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
5	30	Loblolly	Live	Natural	Active	Start (Ad)	Normal	Unstarted	Fresh
5	92	Loblolly	Live	Natural	Relic	Start	Healing	Unavailable	Unavailable
5	93	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
5	94	Loblolly	Live	Natural	Relic	Complete	Restrictor	>15 cm	Old
5	95	Loblolly	Live	Natural	Relic	Complete	Restrictor	15-30 cm	Old
5	96	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
5	97	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
5	98	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
5	99	Loblolly	Dead	Natural	Unavailable	Complete	Unavailable	Unavailable	Unavailable
5	127	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
5	138	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
5	191	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
6	10	Loblolly	Live	Artificial	Inactive	Insert	Normal	>15 cm	Old
6	11	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
6	12	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
6	13	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
6	116	Loblolly	Live	Artificial	Relic	Insert	Normal	>15 cm	Old
6	135a	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Fresh
6	135b	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Recent
6	135c	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Recent
6	137	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old
6	139	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Fresh
6	136a	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Fresh
6	136b	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Fresh
7	105	Loblolly	Live	Artificial	Active	Insert	Normal	>15 cm	Fresh
7	106a	Loblolly	Live	Natural	Active	Complete	<2X	15-30 cm	Fresh
7	106b	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old
7	107	Loblolly	Live	Natural	Active	Complete	<2X	15-30 cm	Fresh
7	108	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Fresh
7	109	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Fresh
7	110	Loblolly	Live	Artificial	Inactive	Insert	Normal	>15 cm	Old
7	111	Loblolly	Live	Artificial	Active	Insert	Normal	>15 cm	Fresh
7	112	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
7	113	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
7	114	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
7	115	Loblolly	Live	Natural	Inactive	Complete	<2X	30-45 cm	Old
8	129	Loblolly	Live	Natural	Active	Complete (New)	Normal	Unstarted	Fresh
7	190	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Fresh
7	194a	Loblolly	Live	Natural	Active	Sub-start	Normal	Unstarted	Fresh
7	194b	Loblolly	Live	Natural	Active	Complete	Normal	15-30 cm	Fresh
7	195	Loblolly	Live	Artificial	Inactive	Insert	Normal	>15 cm	Old
7	NTa	Loblolly	Live	Natural	Active	Sub-start	Normal	Unstarted	Fresh
7	NTb	Loblolly	Live	Natural	Active	Start (Ad)	<2X	> 45 cm	Recent
8	155	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Fresh
8	170	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Fresh

Appendix I. cont.

Cluster	Tree	Species	Condition	Cavity	09 Status	09 Condition	09 Entrance	09 Plate	09 Resin Work
8	171	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Recent
8	172	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Fresh
8	173	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old
8	174a	Loblolly	Live	Natural	Active	Complete	Restrictor	Unstarted	Fresh
8	174b	Loblolly	Live	Natural	Active	Start	Normal	Unstarted	Recent
8	174c	Loblolly	Live	Natural	Active	Start	<2X	Unstarted	Recent
8	175	Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
8	176a	Loblolly	Live	Natural	Inactive	Start (Ad)	<2X	Unstarted	Old
8	176b	Loblolly	Live	Natural	Inactive	Complete	>4X	Unstarted	Old
8	176c	Loblolly	Live	Natural	Inactive	Start	<2X	Unstarted	Old
8	176d	Loblolly	Live	Natural	Inactive	Complete	>2X	Unstarted	Old
8	176e	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old
8	176f	Loblolly	Live	Natural	Inactive	Start	Normal	Unstarted	Old
9	85	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old
9	86	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old
9	87	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old
9	88	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old
10	64	Loblolly	Live	Artificial	Active	Insert	Normal	>15 cm	Recent
10	65	Loblolly	Live	Artificial	Active	Insert	Normal	30-45 cm	Fresh
10	66	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old
10	67	Loblolly	Live	Natural	Inactive	Complete	>4X	Unstarted	Old
10	68	Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
10	150	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old
10	151	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
10	152	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
10	153	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
10	154	Loblolly	Live	Natural	Active	Complete	Normal	Unstarted	Fresh
10	156	Loblolly	Live	Natural	Active	Complete (New)	Normal	Unavailable	Unavailable
11	140	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
11	141	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
11	142	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
11	143	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
12	130	Loblolly	Dead	Artificial	Unavailable	Insert	Unavailable	Unavailable	Unavailable
12	131	Loblolly	Live	Artificial	Relic	Insert	<2X	Unstarted	Old
12	132	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
12	133	Loblolly	Live	Artificial	Relic	Insert	>4X	Unstarted	Old
12	189	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
13	118	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Old
13	119	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
13	120	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
13	121	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
13	122	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
13	123	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
13	124	Loblolly	Live	Artificial	Relic	Insert	Normal	Unstarted	Old
13	126	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old
14	88	Loblolly	Live	Natural	Inactive	Start (Ad)	Normal	Unstarted	Old
14	89	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old
14	90	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old
14	91	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unstarted	Old
14	100	Loblolly	Live	Natural	Inactive	Start	<2X	Unstarted	Old
14	101	Loblolly	Live	Natural	Inactive	Complete	<2X	Unstarted	Old
15	160	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Recent
15	161	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Recent
15	162	Loblolly	Live	Artificial	Active	Insert	Normal	15-30 cm	Fresh
15	163	Loblolly	Live	Artificial	Active	Insert	Normal	Unstarted	Recent
16	165	Loblolly	Live	Natural	Active	Start	Normal	Unavailable	Unavailable
16	166	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unavailable	Unavailable
16	167	Loblolly	Live	Artificial	Inactive	Insert	Normal	Unavailable	Unavailable

Appendix II. Characteristics of Red-cockaded Woodpecker cavities on Piney Grove in 2009.

CLUSTER	Tree	Species	Condition	Direction	Height (feet)	Cavity Stage	Entr. Enlargement	Activity	Depth (inches)	Plate	Chipping	Dry Sap	Fresh Sap	
1	**35**	Loblolly	Live	247	44	3	1	1	6+	5	3	3	3	
1	**36**	Loblolly	Live	207	32	6	1	4		4	4	3	4	
1	**37**	Loblolly	Live	242	52	4	1	3	3	5	4	3	4	
1	**38**	Shortleaf	Dead	152	32.5	1								Standing;
1	**39**	Loblolly	Live	150	32	1	1	1		1	2	2	2	
1	**40**	Loblolly	Dead			1								Broke/standing;
1	**41**	Loblolly	Dead			1								Standing - Broke;
1	**42**	Loblolly	Live	?	?	4	H	4						About 10 holes in tree healing or healed - Red heart fruiting body (RHFB)
1	**43**	Loblolly	Live	277	35	1	4	4		3	4	3	4	4/22/07 tree is leaning;
1	**44**	Loblolly	Live	295	35	1	4	4		3	4	4	4	
1	**45a**	Loblolly	Live	235	38	1	1	1		2	2	2	2	
1	**45b**	Loblolly	Live	83	25	1	2	3		2	4	2	4	Red heart fruiting body;
1	**46**	Loblolly	Live	226	63	1	3	4		4	4	4	4	
1	**47**	Loblolly	Live	251	57	3	R	4	4	5	4	4	4	1/29/08 top broke at ~80'; still has live limbs below break
1	**48**	Loblolly	Live	249	34	1	1	1		1	2	1	2	
1	**49**	Loblolly	Live	260	55	1	4	4		3	4	4	4	
1	**50**	Shortleaf	Dead			6								Fallen
1	**51**	Loblolly	Dead	282	39	6								Standing - Broke
1	**52**	Loblolly	Live	300	35	6	1	4		5	4	4	4	
1	**53**	Loblolly	Live	292	46.5	1	2	1		2	2	2	2	
1	**54**	Loblolly	Live	247	29	4	1	1	4	5	2	3	3	
1	**55**	Loblolly	Live	347	50	1	2	1		5	2	3	3	
1	**57**	Loblolly	Live	259	49	1	1	1		2	2	2	2	Base scar burned
1	**58**	Loblolly	Live	320	39	2	1	1		5	2	3	3	Base scar at 3' & 7';
1	**102**	Loblolly	Live	264	55	1	3	4		4	4	2	4	Tree leaning at 80 degree onto another tree;
1	**117**	Loblolly	Live	221	32	6	1	4		4	4	3	4	
1	**59a**	Loblolly	Live	145	30	4	1	1	1	5	2	3	3	Base scar and others; RHFB; Broken top;
1	**59b**	Loblolly	Live	200	20	4	1	1	1	5	3	3	4	Base scar and others; RHFB; Broken top;
1	**164**	Loblolly	Live	300	30	1	1	1		2	2	2	2	Leaning at 65% angle; RHFB
2	**60**	Loblolly	Live	252	34	6	1	4		5	4	4	4	Healing around insert
2	**61**	Loblolly	Dead			6								Not Found
2	**62**	Loblolly	Dead	290	35	6	1	4						D/S broke at cavity
2	**63**	Loblolly	Live	283	33	6	1	4		5	4	4	4	Healing around insert
3	**1**	Loblolly	Live	234	31	6	1	1		5	2	2	2	
3	**2**	Loblolly	Live	230	32	6	R	1		4	3	2	3	
3	**4a**	Loblolly	Live	80	55	4	1	3	1	5	4	3	4	
3	**4b**	Loblolly	Live	255	44	1	R	1		2	2	2	2	
3	**5**	Loblolly	Live	170	40	4	1	4	3	5	4	4	4	
3	**6**	Loblolly	Live	262	58	1	1	1		5	3	3	3	Healing around entrance
3	**7**	Loblolly	Live	287	36	3	1	1	5+	5	3	3	3	Needs paint (has one band on south side only);
3	**8**	Loblolly	Live	258	56	1	2	1		3	2	1	2	
3	**71**	Loblolly	Dead	224	45	1								Standing - Broke at cavity;
3	**72**	Loblolly	Live	217	45	1	4	4		4	4	3	4	
3	**74**	Loblolly	Dead			1								tree burned to stump; tag still on stump
3	**75**	Loblolly	Live	255	50	1	3	4		5	4	3	4	Healing around entrance
3	**76**	Loblolly	Live	306	31.5	6	1	3		4	4	4	4	
3	**77**	Loblolly	Dead			1								Standing/broke at cavity;
3	**80**	Loblolly	Live	302	30	3	1	1	5	5	2	3	3	
3	**177**	Loblolly	Live	251	30	6	1	3		4	4	4	4	
3	**178**	Loblolly	Live	233	30	4	1	3	4	5	4	3	4	Healing around entrance
3	**3a**	Loblolly	Live	250	27	1	R	1		1	2	2	2	
3	**3b**	Loblolly	Live	28	23	4	1	3	1	5	4	3	4	
3	**79a**	Loblolly	Live	238	50	1	3	4		2	4	2	4	
3	**79b**	Loblolly	Live	72	50	4	1	1	4	5	3	3	3	
3	**79c**	Loblolly	Live	272	33	4	R	3	4	5	4	4	4	
3	**9a**	Loblolly	Live	303	58	4	2	1	1	5	3	3	3	

Appendix II. cont.

CLUSTER	Tree	Species	Condition	Direction	Height (feet)	Cavity Stage	Entr. Enlargement	Activity	Depth (inches)	Plate	Chipping	Dry Sap	Fresh Sap	
3	**9b**	Loblolly	Live	343	50	2	1	1		3	1	2	2	
3	**9c**	Loblolly	Live	224	49	4	1	3	3	5	4	4	4	other holes at 248 deg. 41' 230 deg. 42' and others healed
4	**81**	Loblolly	Dead			6								Fallen - windthrow
4	**82**	Loblolly	Live	240	31.5	6	1	1		4	2	2	2	
4	**83**	Loblolly	Dead	270	32	6								Standing; All bark has fallen off
4	**84**	Loblolly	Live	250	33	6	1	4		5	4	4	4	Tree healing around insert;
4	**186**	Loblolly	Live	230	31.5	6	1	4		5	4	4	4	
5	**18**	Loblolly	Live	250	20	4	1	1	2	5	1	3	3	Found 12/14/08;
5	**19**	Loblolly	Live	230	40	2	1	1		5	2	3	2	Found 12/14/08;
5	**20**	Loblolly	Live	230	51	1	R	4		1	4	2	4	
5	**21**	Loblolly	Dead	283	41	1								Dead/broke at cavity;
5	**22**	Loblolly	Live	296	52	1	4	4		1	4	2	4	New pileated woodpecker entrance excavated next restrictor
5	**23a**	Loblolly	Live	150	55	1	R	1		4	2	2	2	
5	**23b**	Loblolly	Live	325	49.5	1	R	1		1	2	1	2	
5	**24**	Loblolly	Live	365	55	1	R	1		4	4	1	4	Many Pileated WP holes below cavity, possibly hollow, RHFB
5	**25**	Loblolly	Live	273	37.5	1	1	1		2	2	2	2	
5	**26**	Loblolly	Live	200	50	1	R	1		4	2	1	2	
5	**27**	Loblolly	Live	247	24	1	R	3		4	4	2	4	
5	**28**	Loblolly	Live	280	42	1	R	3		4	4	2	4	
5	**29**	Loblolly	Dead			1								Standing - top broke off at ~70'; RHFB;
5	**30**	Loblolly	Live	280	31	3	1	1	5	5	2	3	3	RHFB;
5	**92**	Loblolly	Live	290	30	4	H	4						Entrance healed over
5	**93**	Loblolly	Dead	310	55	1								Dead/Broke at cavity;
5	**94**	Loblolly	Live	304	50	1	R	4		4	4	3	4	4/17/2009 pilieated woodpecker damage about 4 feet above cavity
5	**95**	Loblolly	Live	14	42	1	R	4		3	4	3	4	
5	**96**	Loblolly	Dead			1								Standing - Broke at cavity;
5	**97**	Loblolly	Dead			1								Standing - Broke at cavity;
5	**98**	Loblolly	Dead	206	45	1								Standing;
5	**99**	Loblolly	Dead	300	45	1								Standing;
5	**127**	Loblolly	Live	270	32.5	6	1	4		5	4	4	4	5/23/09 water in bottom
5	**138**	Loblolly	Dead	320	32	6								4/17/09 Dead standing 70% of bark has fallen off
5	**191**	Loblolly	Live	322	32	6	1	4		5	4	4	4	
6	**10**	Loblolly	Live	206	32	6	1	3		4	4	3	4	Insert opens into hollow center of tree
6	**11**	Loblolly	Dead			6								Fallen - windthrow
6	**12**	Loblolly	Dead			6								Standing - broke at cavity
6	**13**	Loblolly	Dead			6								Not Found
6	**116**	Loblolly	Live	170	31.5	6	1	4		4	4	3	4	
6	**135a**	Loblolly	Live	240	41	4	1	1	3	5	1	3	3	
6	**135b**	Loblolly	Live	10	40	4	1	1	1	5	3	3	3	
6	**135c**	Loblolly	Live	195	34.5	6	1	3		5	3	3	4	
6	**137**	Loblolly	Live	207	36	6	1	3		5	4	4	4	
6	**139**	Loblolly	Live	200	31.5	6	1	1		5	1	2	2	3/6/2009 water in cavity; 3/7/09 Hole drilled to drain water
6	**136a**	Loblolly	Live	166	47.5	4	1	1	1	5	2	3	3	Healed around entrance
6	**136b**	Loblolly	Live	184	47	4	1	1	4	5	2	3	3	
7	**105**	Loblolly	Live	260	32.5	6	1	1		4	2	2	2	
7	**106a**	Loblolly	Live	280	36	1	2	1		3	2	2	2	9/29/06 RHFB;
7	**106b**	Loblolly	Live	115	33	4	1	3	3	5	4	3	4	9/29/06 RHFB;
7	**107**	Loblolly	Live	21	29	1	2	1		3	2	2	2	
7	**108**	Loblolly	Live	274	23	4	1	1	2	5	1	3	3	
7	**109**	Loblolly	Live	275	30	4	1	1	4	5	1	3	3	
7	**110**	Loblolly	Live	265	23	6	1	3		4	4	2	4	
7	**111**	Loblolly	Live	286	22	6	1	1		4	2	2	2	
7	**112**	Loblolly	Dead	253	32	6								Dead/Standing; Broke at cavity
7	**113**	Loblolly	Dead			6								Standing - Broke at cavity;
7	**114**	Loblolly	Dead			6								Fallen - windthrow;
7	**115**	Loblolly	Live	274	45	1	2	3		2	4	2	4	

Appendix II. cont.

CLUSTER	Tree	Species	Condition	Direction	Height (feet)	Cavity Stage	Entr. Enlargement	Activity	Depth (inches)	Plate	Chipping	Dry Sap	Fresh Sap	
8	**129**	Loblolly	Live	230	48	2	1	1		5	2	4	3	RHFB;
7	**190**	Loblolly	Live	140	44	4	1	1	4	5	1	4	3	No paint; Blue flagging
7	**194a**	Loblolly	Live	10	36	5	1	1	0	5	1	3	3	Beetle pitch tubes; branch scar at 28'- possible start
7	**194b**	Loblolly	Live	320	34	1	1	1		3	1	2	2	Beetle pitch tubes; branch scar at 28'- possible start
7	**195**	Loblolly	Live	223	29	6	1	3		4	4	3	4	
7	**NTa**	Loblolly	Live	312	43	5	1	1	0	5	2	3	3	
7	**NTb**	Loblolly	Live	312	40	3	2	1	5	1	3	3	4	RHFB;
8	**155**	Loblolly	Live	210	53	4	1	1	2	5	2	4	3	RHFB;
8	**170**	Loblolly	Live	314	33	6	1	1		5	2	2	2	4/17/2009 pilieated woodpecker damage at top of insert
8	**171**	Loblolly	Live	287	33	6	1	1		5	3	3	3	
8	**172**	Loblolly	Live	300	33	6	1	1		5	2	2	2	
8	**173**	Loblolly	Live	255	33	6	1	3		5	4	3	4	
8	**174a**	Loblolly	Live	352	38.5	1	R	1		5	2	2	2	Southern pine beetle pitch tubes
8	**174b**	Loblolly	Live	82	40	4	1	1	2	5	3	3	3	Southern pine beetle pitch tubes
8	**174c**	Loblolly	Live	200	40	4	2	1	3	5	3	3	3	Southern pine beetle pitch tubes
8	**175**	Loblolly	Live		37	1	1	1		5	2	3	2	
8	**176a**	Loblolly	Live	30	44	3	2	3	5	5	4	3	4	Cavity origin does not appear to be RCW
8	**176b**	Loblolly	Live	8	41	1	4	3		5	4	3	4	Cavity origin does not appear to be RCW; Possible roosting cavity
8	**176c**	Loblolly	Live	60	40	4	2	3	4	5	4	3	4	
8	**176d**	Loblolly	Live	290	40	1	3	3		5	4	3	4	
8	**176e**	Loblolly	Live	110	39	4	1	3	1	5	4	3	4	
8	**176f**	Loblolly	Live	280	39	4	1	3	1	5	4	3	4	
9	**85**	Loblolly	Live	255	37	6	1	3		5	4	3	4	
9	**86**	Loblolly	Live	262	39	6	1	3		5	4	2	4	
9	**87**	Loblolly	Live	226	37	6	1	3		5	4	3	4	
9	**88**	Loblolly	Live	230	39	6	1	3		5	4	3	4	
10	**64**	Loblolly	Live	241	34.5	6	1	1		4	3	2	3	
10	**65**	Loblolly	Live	296	36	6	1	1		2	2	2	2	
10	**66**	Loblolly	Live	266	33	6	1	3		5	4	3	4	Pileated damage
10	**67**	Loblolly	Live	305	46	1	4	3		5	4	3	4	
10	**68**	Loblolly	Live	280	27	1	1	1		5	2	3	3	
10	**150**	Loblolly	Live	250	32	6	1	3		5	4	3	4	Pileated damage, 10/31/06 Insert replaced;
10	**151**	Loblolly	Dead			6								Standing - Broke at cavity
10	**152**	Loblolly	Dead			6								Standing - Broke at cavity
10	**153**	Loblolly	Dead			6								Standing - Broke at cavity
10	**154**	Loblolly	Live	275	27	1	1	1		5	1	2	2	RHFB;
10	**156**	Loblolly	Live	W	33	2	1	1						Found in 2009
11	**140**	Loblolly	Live	195	31	6	1	4		5	4	4	4	
11	**141**	Loblolly	Live	202	31	6	1	4		5	4	4	4	
11	**142**	Loblolly	Live	264	31	6	1	4		5	4	4	4	
11	**143**	Loblolly	Live	220	31	6	1	4		5	4	4	4	
12	**130**	Loblolly	Dead			6								Fallen - windthrow
12	**131**	Loblolly	Live	320	23	6	2	4		5	4	4	4	Metal front of instert box exposed completely
12	**132**	Loblolly	Live	305	33	6	1	4		5	4	4	4	
12	**133**	Loblolly	Live	280	33	6	4	4		5	4	4	4	Metal front of instert box exposed completely
12	**189**	Loblolly	Live	253	31	6	1	4		5	4	4	4	
13	**118**	Loblolly	Live	212	37	6	1	1		5	4	4	4	
13	**119**	Loblolly	Live	240	36	6	1	4		5	4	4	4	
13	**120**	Loblolly	Live	250	36	6	1	4		5	4	4	4	
13	**121**	Loblolly	Live	210	32	6	1	4		5	4	4	4	
13	**122**	Loblolly	Live	260	22	6	1	4		5	4	4	4	
13	**123**	Loblolly	Live	239	32.5	6	1	4		5	4	4	4	
13	**124**	Loblolly	Live	270	32.5	6	1	4		5	4	4	4	
13	**126**	Loblolly	Live	230	33	6	1	3		5	4	4	4	Installed in 2009
14	**88**	Loblolly	Live	294	40	3	1	3	5	5	4	4	4	need re-tag #, double tagged w/ C9;
14	**89**	Loblolly	Live	220	32	6	1	3		5	4	4	4	

Appendix II. cont.

CLUSTER	Tree	Species	Condition	Direction	Height (feet)	Cavity Stage	Entr. Enlargement	Activity	Depth (inches)	Plate	Chipping	Dry Sap	Fresh Sap	
14	**90**	Loblolly	Live	227	33	6	1	3		5	4	4	4	
14	**91**	Loblolly	Live	246	31.5	6	1	3		5	4	4	4	
14	**100**	Loblolly	Live	256	44	4	2	3	2	5	4	4	4	RHFB;
14	**101**	Loblolly	Live	265	43	1	2	3		5	4	3	4	
15	**160**	Loblolly	Live	230	35	6	1	1		5	3	3	3	
15	**161**	Loblolly	Live	240	36	6	1	1		5	3	3	3	
15	**162**	Loblolly	Live	225	37	6	1	1		3	2	2	2	
15	**163**	Loblolly	Live	230	37	6	1	1		5	3	4	3	
16	**165**	Loblolly	Live	25	N	4	1	1						Found Fall 2009
16	**166**	Loblolly	Live	28	W	6	1	3						Installed in 2009
16	**167**	Loblolly	Live	28	W	6	1	3						Installed in 2009

Appendix III. Occurrences and management of competitors in Red-cockaded Woodpecker cavities in Piney Grove cavity during 2009.

CLUSTER	Tree	Date	Occupant	Date	Occupant
1	35				
1	36	04/08/09	2 GLVO removed		
1	37				
1	38				
1	39				
1	40				
1	41				
1	42				
1	43				
1	44				
1	45a	05/11/09	2 GLVO removed		
1	45b	04/08/09	1 GLVO removed		
1	46				
1	47				
1	48	05/16/09	2 eggs on wood chips		
1	49				
1	50				
1	51				
1	52				
1	53				
1	54				
1	55				
1	57				
1	58				
1	102				
1	117	04/08/09	GLVO removed		
1	59a				
1	59b				
1	164				
2	60				
2	61				
2	62				
2	63				
3	1				
3	2	05/16/09	Nest material		
3	4a				
3	4b				
3	5				
3	6				
3	7				
3	8				
3	71				

Appendix III. cont.

3	72				
3	74				
3	75				
3	76	04/17/09	SICA nest		
3	77				
3	80				
3	177	04/17/09	Nest material		
3	178				
3	3a				
3	3b				
3	79a				
3	79b				
3	79c				
3	9a				
3	9b				
3	9c				
4	81				
4	82				
4	83				
4	84	01/15/09	UNSP		
4	186	01/15/09	UNSP		
5	18				
5	19				
5	20				
5	21				
5	22				
5	23a				
5	23b				
5	24				
5	25				
5	26				
5	27				
5	28				
5	29				
5	30				
5	92				
5	93				
5	94				
5	95				
5	96				
5	97				
5	98				
5	99				
5	127				
5	138				
5	191	04/17/09	Unidentified bird nest- 4 eggs		
6	10	04/08/09	Unidentified bird nest- 2 eggs	05/16/09	Nest material

Appendix III. cont.

6	11				
6	12				
6	13				
6	116				
6	135a				
6	135b				
6	135c				
6	137				
6	139				
6	136a				
6	136b				
7	105				
7	106a				
7	106b				
7	107	04/17/09	GLVO removed		
7	108				
7	109				
7	110	04/17/09	Nest material	06/20/09	Nest material
7	111	06/20/09	Nest material		
7	112				
7	113				
7	114				
7	115				
8	129				
7	190				
7	194a				
7	194b				
7	195	03/06/09	Nest material		
7	NTa				
7	NTb				
8	155				
8	170				
8	171				
8	172				
8	173	07/05/09	Nest material	07/17/09	SICA nest
8	174a				
8	174b				
8	174c				
8	175				
8	176a				
8	176b				
8	176c				
8	176d				
8	176e				
8	176f				
9	85				
9	86	05/16/09	GLVO removed		

Appendix III. cont

9	87	03/06/09	Nest material		
9	88				
10	64	04/08/09	2 GLVO removed	05/16/09	3 GLVO removed
10	65				
10	66				
10	67	06/20/09	MYCR nest		
10	68	06/20/09	3 GLVO removed	07/05/09	GLVO escaped
10	150				
10	151				
10	152				
10	153				
10	154				
10	156				
11	140				
11	141				
11	142	06/20/09	Nest material		
11	143				
12	130				
12	131				
12	132				
12	133				
12	189				
13	118				
13	119				
13	120				
13	121	01/15/09	Nest material		
13	122	05/16/09	GLVO removed		
13	123	01/15/09	Nest material		
13	124	03/06/09	Nest material		
13	126				
14	88				
14	89				
14	90	04/08/09	Unidentified bird nest		
14	91	04/08/09	SICA nest		
14	100				
14	101	07/05/09	GLVO 1 removed -1 escaped		
15	160	04/18/09	2 GLVO removed		
15	161	05/16/09	GLVO 1 removed -1 escaped		
15	162				
15	163	04/18/09	4 GLVO removed		

Occupant key to Appendix III.

Code	Occupant description	Code	Occupant description
Bosp	Bumble Bee species	Pabi	Tufted Titmouse
Glvo	Southern Flying Squirrel	Pibo	Red-cockaded Woodpecker
Hych	Gray Tree frog	Posp	Polistes wasp species
Elob/Elsp	Rat Snake species	Sica	White-breasted nuthatch
Mycr	Great crested flycatcher	Sipu	Brown-headed nuthatch